ITU-T & Related U.S. Standards Development

Outputs

- Leadership of ITU-T and related U.S. telecommunications standards committees.
- Technical contributions presenting U.S. standards proposals and ITS research results.
- Proposed ITU-T Recommendations and associated U.S. industry standards.

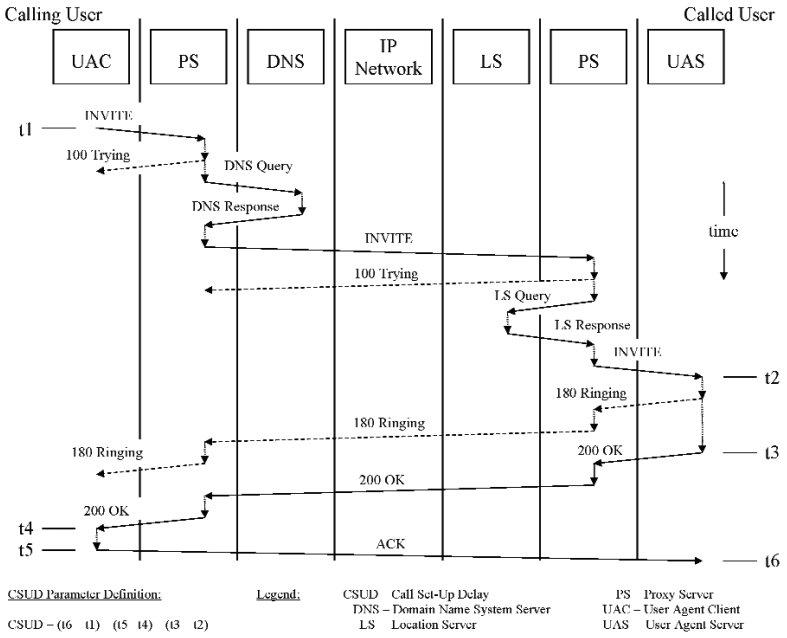
The Institute has a long history of leadership, technical contributions, and advocacy of U.S. Government and industry proposals in the International Telecommunication Union's Telecommunication Standardization Sector (ITU-T) and related U.S. standards organizations. ITU-T is a specialized agency of the UN, responsible for developing the international standards (Recommendations) providers use to plan, interconnect, and operate public telecommunication networks and services worldwide. ITU-T's Recommendations impact both the evolution of U.S. telecommunications infrastructures and the competitiveness of U.S. telecommunications products in international trade.

The Institute's long-term goal in ITU-T (and in related national standards work) is to motivate the standardization of user-oriented, technology-independent measures of telecommunication Quality of Service (QoS) — and to relate those user-oriented measures with the technology-specific performance metrics and mechanisms providers use to provision and operate networks. This ITS work promotes fair competition and technology innovation in the telecommunications industry, facilitates interworking among independently-operated networks and dissimilar technologies, and gives users a quantitative, practical means of defining their telecommunication requirements and selecting products and services that meet them.

In FY 2005, the Institute provided leadership in two key ITU-T groups: Study Group (SG) 13 and SG 9's Working Group on Quality Assessment. SG 13 is developing technical standards that will enable the convergence of circuit-switched and packet-switched networks in Internet Protocol (IP) based Next Generation Networks (NGNs). SG 13 is also responsible for NGN standardization release planning and project management. An ITS staff member serves as Vice Chair of ITU-T SG 13 and its NGN Focus Group (FGNGN), and chairs SG 13's Working Party (WP) 4, which develops technical standards on NGN QoS and Operation, Administration, and Maintenance (OAM). The FGNGN in particular has attracted strong industry support, with international meetings every two months, average attendance exceeding 150, and over 900 technical contributions during FY 2005. SG 9's Working Group on Quality Assessment defines quality objectives for integrated broadband cable networks and television and sound transmission. In that group ITS chairs Question 14/9, "Objective and Subjective Methods for Evaluating Audiovisual Quality in Multimedia Services." ITS also provides leadership and technical contributions in the ITU affiliated Video Quality Experts Group (VQEG) and the Alliance for Telecommunications Industry Solutions (ATIS) Network Performance, Reliability and Quality of Service Committee (PRQC), formerly T1A1. VQEG works in conjunction with ITU-T SG 9 and ITU-R WP 6Q (Broadcasting Services — Performance Assessment and Quality Control) to develop objective, computer implementable, perception-based video quality metrics (VQMs) that emulate the human visual system. PRQC develops national standards and contributes strongly to ITU-T standardization in all of these technology areas. ITS also leads the Joint Rapporteur Group on Multimedia Quality Assessment (JRG-MMQA) a cross-cutting ITU-T standards body that unites the video quality expertise of SG 9 with the audio quality expertise of SG 12 in a cooperative effort to develop objective, perception-based metrics for combined audio and video signals in mobile and PC environments.

Under ITS leadership, SG 13/WP 4 drafted three new ITU-T Recommendations during FY 2005: Y.17fw (MPLS management framework), Y.17ethoam (OAM functions and mechanisms for Ethernet-based networks), and Y.123qos (A QoS control architecture for Ethernet-based IP access networks). WP 4 also completed (and SG 13 approved) a revision to ITU-T Recommendation Y.1711 (Operation and maintenance mechanism for MPLS networks). With other leaders, ITS presented NGN standardization results in two ITU-T workshops (NGN Technical Workshop, ITU-T Workshop on NGN in collaboration with IETF). These

two events attracted over 600 attendees. ITS also contributed strongly to the development and approval of a key FGNGN output, published as ITU-T Q-Series Supplement 51 (Signalling Requirements for IP QoS). This specification will be important in standardizing new signalling technologies capable of fully integrating today's wired telephony, video, wireless, and Internet-based infrastructures and services — and motivating the capital investment needed to deploy them.



Example call processing parameter definition.

In PRQC, ITS leadership contributed to new specifications that define priority levels, security requirements, and performance measurement techniques for IP-based networks. ITS also developed PRQC contributions to ITU-T standards work on NGN QoS metrics, specification and apportionment of NGN QoS values, and the allocation of FGNGN work to ITU-T Study Groups. The Institute spearheaded PRQC's FY 2005 efforts to achieve QoS interoperability among NGNs employing different broadband access technologies (e.g., DSL, IPCablecom, Ethernet, Wi-Fi).

In one FY 2005 contribution to PRQC, ITS defined a comprehensive approach to call processing performance specification in networks that use the Internet Engineering Task Force (IETF) defined Session Initiation Protocol (SIP) in establishing and terminating IP media sessions (or "calls"). Such specifications will be needed to support Service Level Agreements (SLAs) and other requirements in deployed NGNs. The figure above shows how one particular SIP-based call processing parameter ("call set-up delay") can be defined. ITS also proposed (and PRQC standardized) an innovative signal processing technology that promotes accurate speech quality measurement in communication systems with rapidly varying transmission delays. Such delays are common in Voice over IP (VoIP) and IP based multimedia communication services, and it will be important to track them in measuring IP network QoS.

ITS has co-chaired the ITU Video Quality Experts Group since its formation in 1997. VQEG enables video experts from many countries to collaborate in developing and evaluating video quality metrics, and its results strongly impact the standardization of VQMs in both ITU-T and ITU-R. The group works primarily via an e-mail reflector, publicly accessible at http://www.VQEG.org. During FY 2005 the number of participants subscribed to this reflector grew to 450. ITS chaired two physical VQEG meetings in FY 2005.

ITS also contributed to VQEG's upcoming Reduced Reference-No Reference (RR-NR) TV and Multimedia video tests during FY 2005, by helping to finalize the test plans and providing video source material. ITS is spearheading new ITU-T work on multimedia quality assessment through its leadership in VQEG and the JRG-MMQA. The latter group met three times during FY 2005.

Recent Publication

C. Dvorak and N. Seitz, "Signalling and interworking challenges for quality of service in the next-generation network," *Journal of the Communications Network*, April-June 2004.

For more information, contact:
Neal B. Seitz
(303) 497-3106
e-mail nseitz@its.bldrdoc.gov